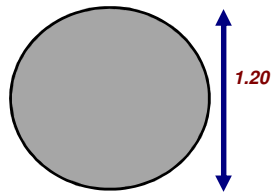


"PILOTES PUENTE QUILCA"

1.00 ANALISIS - ESTADO LIMITE DE RESISTENCIA

	Mx (Ton-m)	My (Ton-m)
DC	10.15	12.74
RLL+IM	3.53	6.13

1.10 VERIFICACIÓN POR ESBELTEZ



Datos Columna

$f'c = 280.00 \text{ Kg/cm}^2$
 $f_y = 4200.00 \text{ Kg/cm}^2$
 $E_c = 2.51E+05 \text{ Kg/cm}^2$
 $Hcol = 6.00 \text{ m}$
 $k = 2.00$
 $D = 1.20 \text{ m}$

$A = 1.13 \text{ m}^2$
 $I_x = 1.02E-01 \text{ m}^4$
 $I_y = 1.02E-01 \text{ m}^4$
 $r_x = 0.30 \text{ m}$
 $r_y = 0.30 \text{ m}$

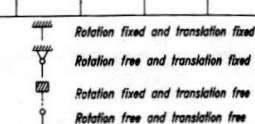
$k \cdot l / r_x = 40.00 \rightarrow \text{Considerar Efectos de Esbeltez}$
 $k \cdot l / r_y = 40.00 \rightarrow \text{Considerar Efectos de Esbeltez}$

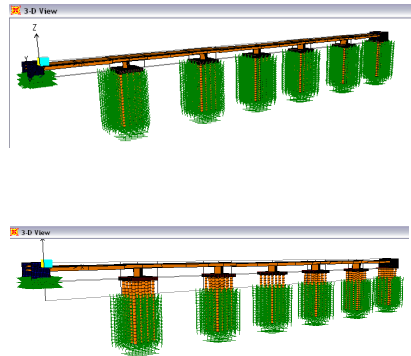
Calculos Columna:

$\beta_{dx} = 0.67$	$\beta_{dy} = 0.60$
$EI_x = 6.11E+04$	$EI_y = 6.40E+04$
$P_{cx} = 4187.37$	$P_{cy} = 4384.49$
$C_m = 1.00$	$C_m = 1.00$
$\Sigma P_u = 294.60$	$\Sigma P_u = 294.60$
$\phi = 0.75$	$\phi = 0.75$
$\delta_{sx} = 1.10$	$\delta_{sy} = 1.10$

	P (Ton)	Vx (Ton)	Vy (Ton)	Mx (Ton-m)	My (Ton-m)
	226.99	0.00	0.00	0.00	0.00
	121.88	11.28	4.65	8.49	20.30
	98.75	11.14	3.16	5.77	20.51
	121.75	4.72	11.19	20.45	8.32
	98.94	3.22	11.19	20.45	5.62
	116.65	4.72	11.19	37.23	15.37
	93.84	3.22	11.19	37.23	10.47
	116.67	11.22	4.64	15.44	37.20
	93.64	11.10	3.16	10.51	37.23
	227.61	0.00	0.00	0.00	0.00
	147.37	3.03	1.24	1.03	2.55
	73.05	3.62	0.02	0.06	3.40
	147.22	1.29	2.97	2.47	1.06
	124.41	0.87	2.97	2.47	1.79
	116.65	1.29	2.97	23.10	9.81
	93.84	0.87	2.97	23.10	6.69
	116.80	3.03	0.84	6.56	23.32
	42.47	3.62	0.03	0.18	29.17

K Values for Columns

	(a)	(b)	(c)	(d)	(e)	(f)
Buckled shape of column is shown by dashed line.						
Theoretical K value	0.5	0.7	1.0	1.0	2.0	2.0
Recommended design value when ideal conditions are approximated	0.65	0.80	1.2	1.0	2.10	2.0
End condition code						





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Descripción del Trabajo: Pilotes Pte Quilca

DESARROLLO

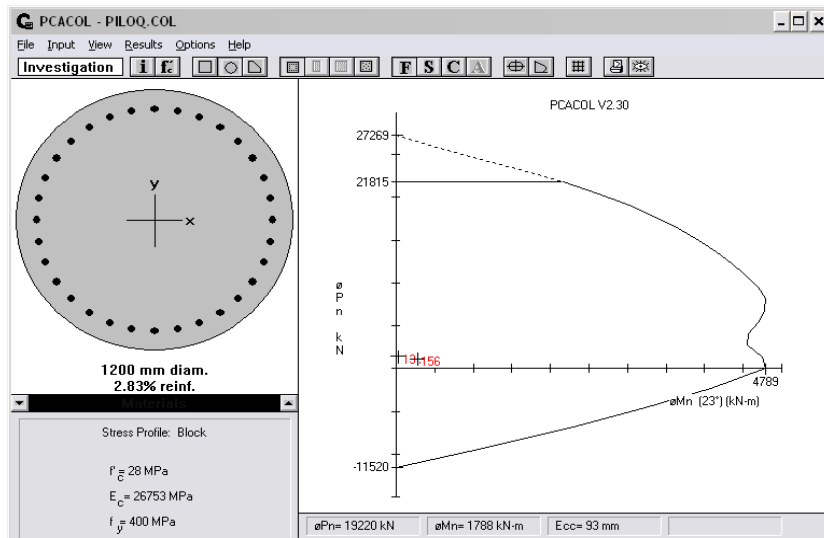
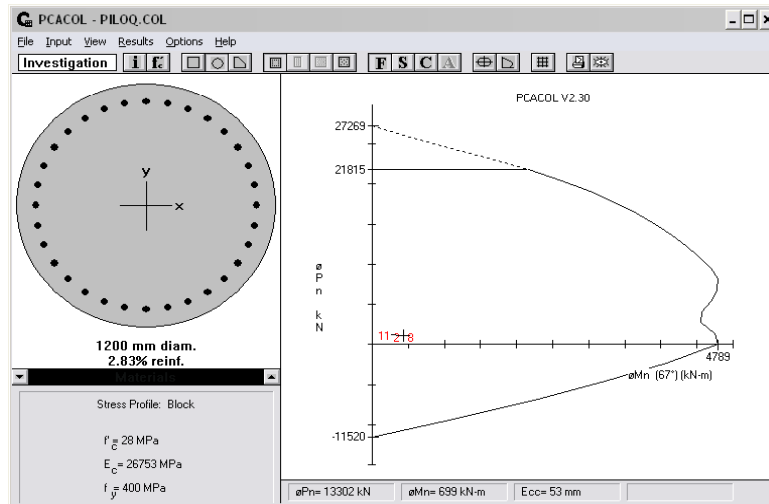
REFERENCIA


1.20 DISEÑO POR FLEJO-COMPRESIÓN

ESTADO LÍMITE RESISTENCIA I	P (Ton)	Mx (Ton-m)	My (Ton-m)
	226.99	0.00	0.00
	121.88	9.37	22.30
	98.75	6.37	22.53
	121.75	22.57	9.14
	98.94	22.57	6.17
	116.65	41.09	16.88
	93.84	41.09	11.51
	116.67	17.04	40.86
	93.64	11.60	40.89
	227.61	0.00	0.00
	147.37	1.14	2.80
	73.05	0.06	3.73
	147.22	2.73	1.17
	124.41	2.73	1.97
	116.65	25.49	10.78
	93.84	25.49	7.34
	116.80	7.24	25.61
	42.47	0.20	32.05



P (KN)	Mx (KN-m)	My (KN-m)
2226.82	0.00	0.00
1195.60	91.92	218.75
968.70	62.51	220.97
1194.34	221.38	89.66
970.55	221.38	60.54
1144.36	403.07	165.62
920.57	403.07	112.86
1144.51	167.13	400.82
918.60	113.75	401.15
2232.90	0.00	0.00
1445.71	11.19	27.49
716.57	0.64	36.61
1444.23	26.79	11.46
1220.44	26.79	19.32
1144.32	250.07	105.74
920.53	250.07	72.03
1145.80	70.99	251.25
416.67	1.99	314.37



	HOJA DE CALCULO	Código: Revisión: Página: de Especialidad: Estructuras
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DESARROLLO		REFERENCIA

→ Usar 32 ϕ 1 3/8"

1.30 DISEÑO POR FUERZA CORTANTE

$f_c = 280 \text{ Kg/cm}^2$
 $f_y = 4200 \text{ Kg/cm}^2$

ESTADO LÍMITE RESISTENCIA I	V_x (Ton)	V_y (Ton)	V_u : Cortante máximo en kg V_c : Resistencia la corte del concreto en kg A_v : Area de acero correspondiente a 3/8" (Zunchos)
	11.28	11.19	

d (cm)	V_{ux} (kg)	V_c (kg)	V_s (kg)	$\phi(V_c+V_s)$	$V_u < \phi(V_c+V_s)$	A_v (cm ²)	S (mm)
84.94	11280	50254	67544	100128	OK!!!	0.71	75

d (cm)	V_{ux} (kg)	V_c (kg)	V_s (kg)	$\phi(V_c+V_s)$	$V_u < \phi(V_c+V_s)$	A_v (cm ²)	S (mm)
84.94	11189	50254	67544	100128	OK!!!	0.71	75



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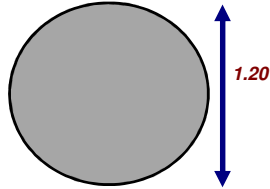
Proyecto: Estudio Definitivo de la carretera: Camana - Desvio Quilca - Matarani - Ilo - Tacna, Tramo: Desvio Quilca - Matrani
Descripción del Trabajo: Pilotes Pte Quilca

DESARROLLO

REFERENCIA

2.00 ANALISIS - ESTADO LIMITE DE EVENTO EXTREMO

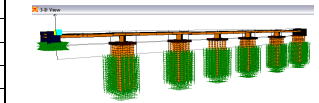
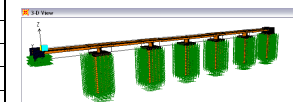
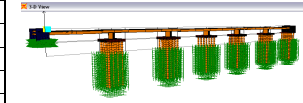
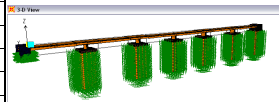
2.10 PROPIEDADES



Datos Columna

$f_c = 280.00 \text{ Kg/cm}^2$
 $f_y = 4200.00 \text{ Kg/cm}^2$
 $E_c = 2.51E+05 \text{ Kg/cm}^2$
 $D = 1.20 \text{ m}$

	P (Ton)	Vx (Ton)	Vy (Ton)	Mx (Ton-m)	My (Ton-m)
EVENTO EXTREMO X	261.70	0.00	0.00	0.00	0.00
	141.05	31.18	17.02	41.62	69.10
	63.68	31.22	10.09	29.05	69.02
	137.43	22.75	25.63	50.23	62.04
	69.15	15.73	25.63	50.23	49.74
	129.42	9.81	8.55	54.44	71.79
	90.10	11.30	20.77	54.44	47.10
	128.53	9.94	1.53	26.00	74.05
	89.37	25.72	6.00	26.10	74.13
	316.99	0.02	0.02	0.00	0.00
	173.01	53.34	24.17	0.00	102.72
	98.10	53.23	20.64	0.00	106.92
	124.64	0.08	29.15	0.00	69.54
	91.49	0.33	29.15	0.00	69.54
	114.30	0.25	19.51	145.80	1.81
	81.59	1.06	21.77	145.80	0.53
140.95	39.47	21.93	102.48	229.68	
69.03	39.36	21.90	102.30	229.23	
EVENTO EXTREMO Y	324.27	0.00	0.01	0.00	0.00
	148.92	17.76	51.23	149.40	36.86
	70.10	17.64	37.51	124.38	37.17
	203.08	11.13	64.72	129.64	25.15
	3.50	4.11	64.72	129.64	12.86
	149.42	11.78	13.86	149.40	36.86
	70.22	3.92	51.23	149.40	12.17
	143.83	17.76	51.23	94.50	55.13
	65.00	17.64	51.21	94.39	55.26
	472.64	0.01	0.06	0.00	0.00
	219.71	17.47	72.71	0.00	351.40
	51.19	17.39	72.62	0.00	351.11
	169.00	0.06	96.37	0.00	237.73
	69.39	0.75	96.37	0.00	237.73
	158.60	0.21	64.69	481.00	4.04
	59.62	0.01	66.66	481.00	0.31
187.55	13.35	68.73	307.55	81.04	
22.21	13.27	68.64	307.02	80.78	





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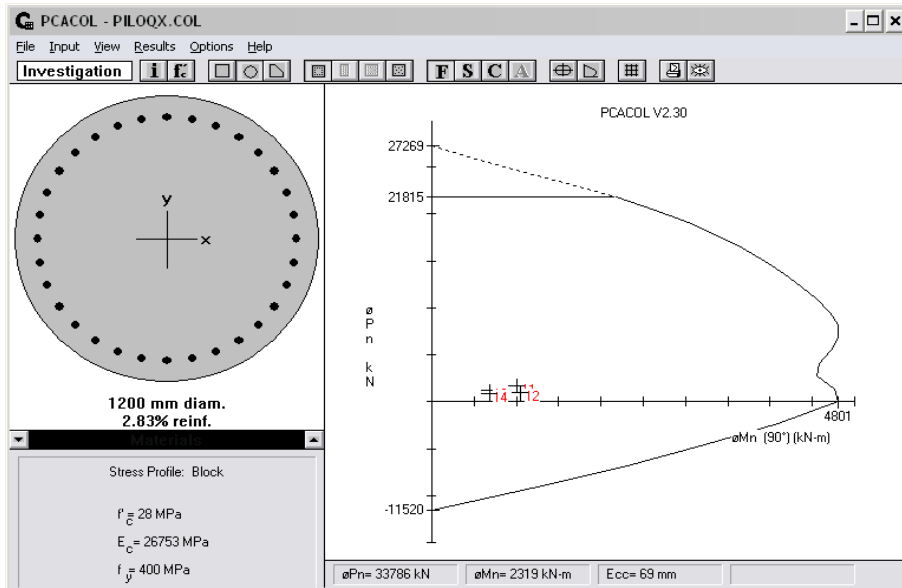
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Descripción del Trabajo: Pilotes Pte Quilca

DESARROLLO

REFERENCIA

2.20 DISEÑO POR FLEJO-COMPRESIÓN

	P (Ton)	Mx (Ton-m)	My (Ton-m)		P (KN)	Mx (KN-m)	My (KN-m)
EVENTO EXTREMO X	261.70	0.00	0.00	→	2567.26	0.00	0.00
	141.05	41.62	69.10		1383.74	408.27	677.86
	63.68	29.05	69.02		624.72	284.97	677.09
	137.43	50.23	62.04		1348.18	492.77	608.59
	69.15	50.23	49.74		678.41	492.77	487.98
	129.42	54.44	71.79		1269.58	534.04	704.28
	90.10	54.44	47.10		883.88	534.04	462.09
	128.53	26.00	74.05		1260.88	255.05	726.47
	89.37	26.10	74.13		876.73	256.06	727.18
	316.99	0.00	0.00		3109.63	0.00	0.00
	173.01	0.00	102.72		1697.27	0.00	1007.68
	98.10	0.00	106.92		962.40	0.00	1048.93
	124.64	0.00	69.54		1222.73	0.00	682.21
	91.49	0.00	69.54		897.56	0.00	682.21
	114.30	145.80	1.81		1121.33	1430.28	17.76
	81.59	145.80	0.53		800.43	1430.28	5.17
140.95	102.48	229.68	1382.73	1005.34	2253.12		
69.03	102.30	229.23	677.20	1003.56	2248.74		
EVENTO EXTREMO Y	324.27	0.00	0.00	3181.12	0.00	0.00	
	148.92	149.40	36.86	1460.91	1465.66	361.61	
	70.10	124.38	37.17	687.64	1220.16	364.68	
	203.08	129.64	25.15	1992.21	1271.73	246.73	
	3.50	129.64	12.86	34.38	1271.73	126.11	
	149.42	149.40	36.86	1465.84	1465.66	361.61	
	70.22	149.40	12.17	688.87	1465.66	119.41	
	143.83	94.50	55.13	1410.93	927.02	540.84	
	65.00	94.39	55.26	637.66	925.94	542.12	
	472.64	0.00	0.00	4636.62	0.00	0.00	
	219.71	0.00	351.40	2155.40	0.00	3447.26	
	51.19	0.00	351.11	502.17	0.00	3444.34	
	169.00	0.00	237.73	1657.93	0.00	2332.09	
	69.39	0.00	237.73	680.74	0.00	2332.09	
	158.60	481.00	4.04	1555.89	4718.63	39.60	
	59.62	481.00	0.31	584.92	4718.63	3.00	
187.55	307.55	81.04	1839.90	3017.11	794.99		
22.21	307.02	80.78	217.86	3011.87	792.43		





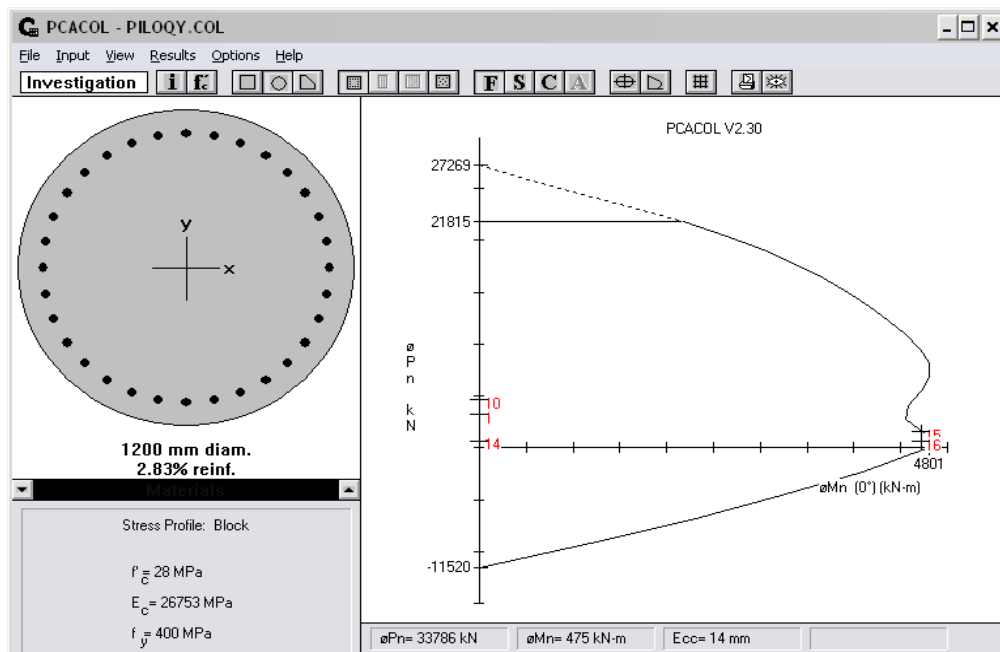
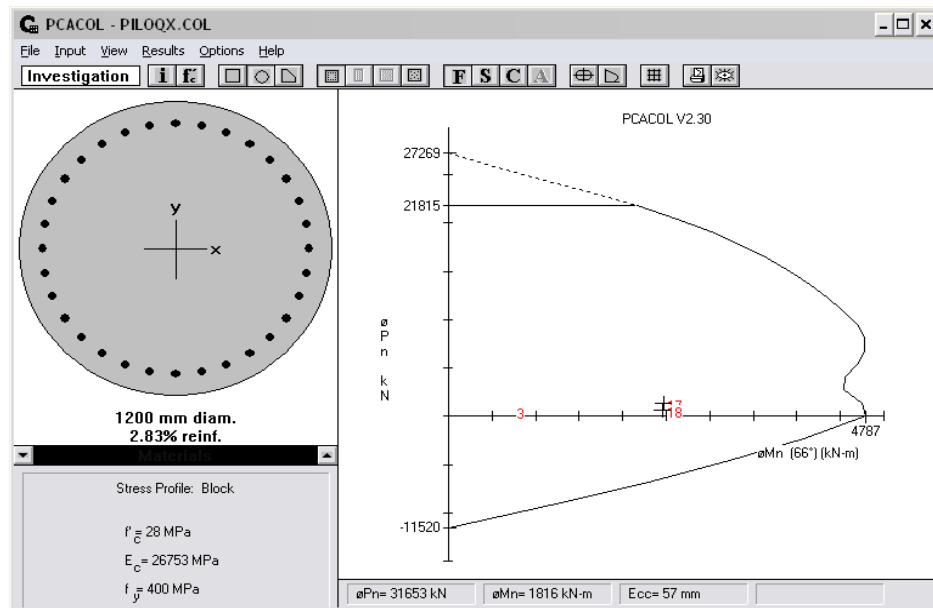
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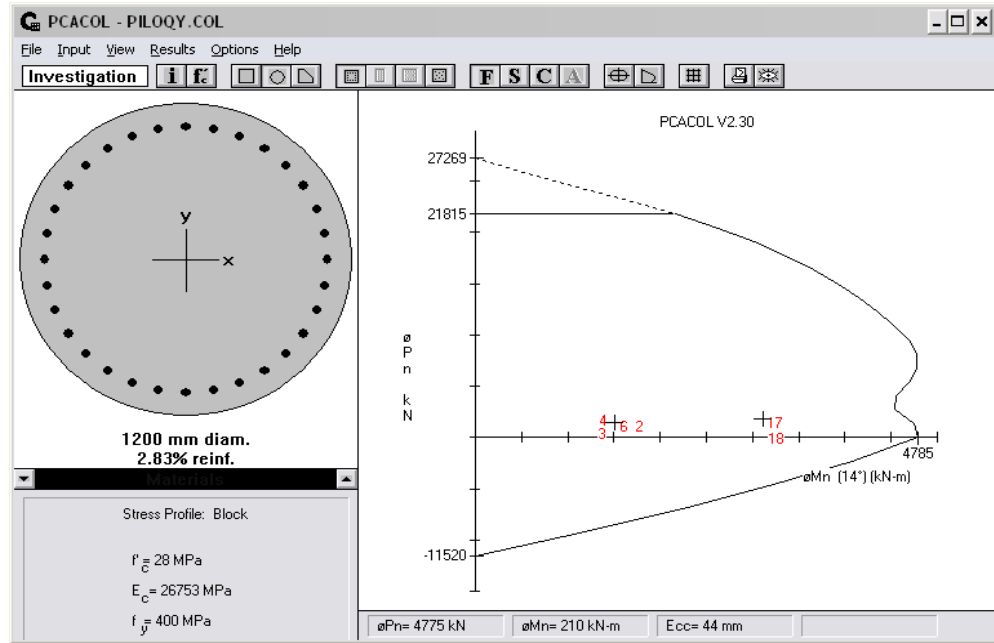
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Descripción del Trabajo: Pilotes Pte Quilca

DESARROLLO

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2.30 DISEÑO POR FUERZA CORTANTE

$f_c = 280 \text{ Kg/cm}^2$
 $f_y = 4200 \text{ Kg/cm}^2$

ESTADO LIMITE RESISTENCIA I	Vx (Ton)	Vy (Ton)
	53.34	96.37

Vu: Cortante máximo en kg
Vc: Resistencia la corte del concreto en kg
Av: Area de acero correspondiente a 3/8" (Zunchos)

d (cm)	Vux (kg)	Vc (kg)	Vs (kg)	$\phi(Vc+Vs)$	Vu < $\phi(Vc+Vs)$	Av (cm2)	S (mm)
84.94	53336	50254	67544	100128	OK!!!	0.71	75

d (cm)	Vux (kg)	Vc (kg)	Vs (kg)	$\phi(Vc+Vs)$	Vu < $\phi(Vc+Vs)$	Av (cm2)	S (mm)
84.94	96365	50254	67544	100128	OK!!!	0.71	75